Abstract

Title: The influence of barefoot running on running kinetics.

Objectives: The aim of this work is to assess the influence of different footwear (regular running shoes, barefoot footwear and barefoot running) on footstrike (rear-foot strike, mid-foot strike and fore-foot strike) during running and evaluate the action of reaction forces in different types of footstrike.

Methods: In this study participated 11 runners (only men), who were divided in three groups based on their preferred footwear. Kinetic data (reaction forces) were collected by using a Kistler force plate, which was crossed by the participants with subjectively chosen speed. Kinematic parameters of running (speed) and video recordings of a single footstrikes were obtained by using a Qualisys system of optoelectronic stereophotogrammetry. All the measurements occurred during one day. Collected data were exported to Microsoft Excel 2013 programme, where the graphs of reaction forces were created and to Qualisys Track Manager software. Assessment was based on created graphs and video recordings.

Results: The results show that runners wearing regular running shoes preferred a rear-foot strike, while among runners in barefoot footwear a fore-foot strike than mid-foot strike prevailed a bit. Among barefoot runners dominated a fore-foot strike. In question of vertical reaction forces during rear-foot strike the curve of the graph included two peaks. Among runners with barefoot running shoes the curve also included two peaks, however the shape was noticeably more fluent. The curve of the barefoot runners was completely fluent without any presence of two peaks. Curves of anterio-posterior reaction forces were more fluent and reached lower maximal force values during fore-foot strikes in comparison with mid-foot strikes or rear-foot strikes.

Keywords: barefoot running, barefoot footwear, running kinetics